FISHES FROM WAKASA BAY, JAPAN SEA

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With 1 Text-figure and 2 Tables

Introduction

The first paper dealing with the distribution of fishes in Japanese waters was published by TANAKA (1931). After this, as to the fish fauna of the Japan Sea, KATAYAMA (1940), YANAI (1950), HONMA (1952–'62), MORI (1956), etc. contributed to elucidate the fish distribution respectively in Toyama Bay, Shimane Prefecture, Niigata Prefecture, San'in District and adjacent waters, and other areas. But so far, no paper has been published to report the ichthyofauna of Wakasa Bay which is situated between the northerly located Hokuriku District including Toyama Bay and Niigata Prefecture and the southerly located San'in District including Shimane Prefecture, though the results of two preliminary studies were presented respectively by INADA and TAKANO at some seminars held at the Department of Fisheries, Faculty of Agriculture of Kyoto University, Maizuru (1967).

From the zoogeographical point of view, it seemed to us very interesting and significant to fill up this gap in our knowledge of the fish distribution along the Japan Sea coast of Honshu Island. First we gathered the data by picking up the records from Wakasa Bay out of those on the specimen lists of fishes preserved at the Department of Fisheries, Faculty of Agriculture of Kyoto University. At the same time, specimens were collected at the market of the Fishermen's Union at Nishi-Maizuru and from the gathered samples caught during the survey made by Kyoto Prefectural Fisheries Experimental Station. All the specimens were identified exactly to make up the complete list, and lastly we tried to make some considerations on the fish distribution in the district analysing the contents of the list. The work was started in April 1968 and closed in February 1969.

The present study was done under the direction of the late Prof. Kiyomatsu MATSUBARA, to whom we are very grateful and we like to dedicate this note short but accompanied with a considerably comprehensive list. We also wish to express our thanks to Dr. Tamotsu IWAI for his kindness in reading the manuscript and helping us by his effectual criticisms. We owed much to Messrs. I. NAKAMURA, I. HAYASHI, K. KURAWAKA, M. TANAKA, T. FUZII, N. TANIGUCHI, T. INADA, K. TAKANO, H. KOZIMA, S. YAMAMOTO, T. YOSHINO and M. SUZUKI of our laboratory

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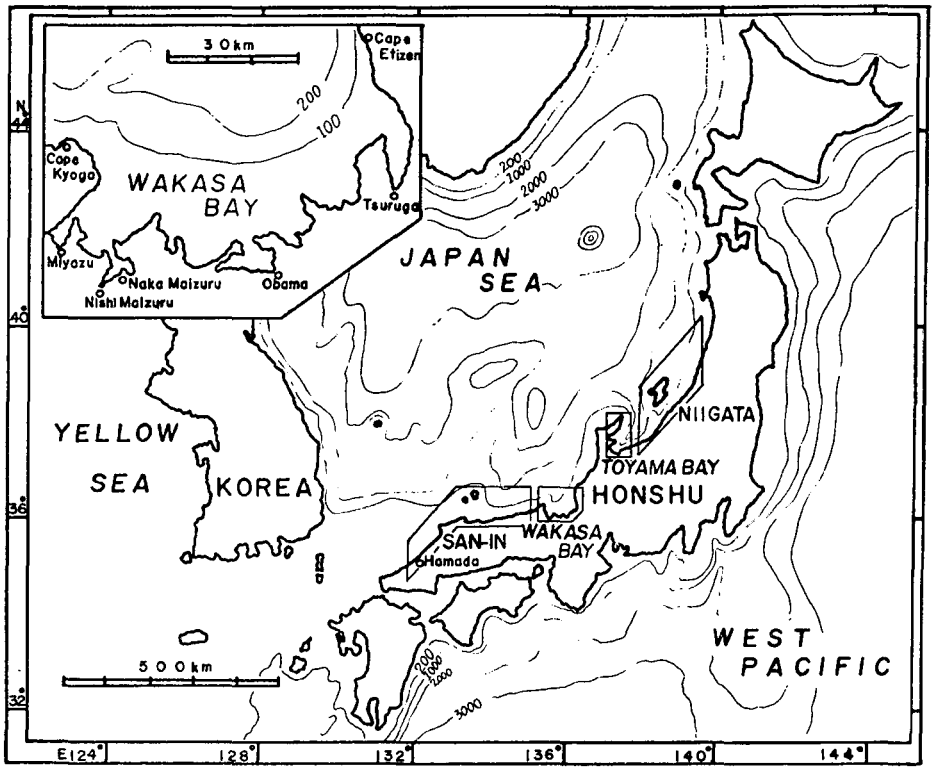

Fig. 1. Showing the positions of Wakasa Bay and three other areas referred to in faunistic comparison The insert indicates the geographical details of Wakasa Bay.

of the Department of Fisheries in carrying out the study; our hearty thanks to them are due. We are grateful, too, to Mr. M. NISHIMURA for his kindness in affording us his specimens and to Dr. T. TOKIOKA and Dr. S. NISHIMURA of the Seto Marine Biological Laboratory for their helpful advices.

List of the fishes from Wakasa Bay

The listed species are confined to marine fishes, though *Plecoglossus altivelis* TEMMINCK et SCHLEGEL of Plecoglossidae and fishes of Anguillidae are included within. This is because of the fact that the former spends the early life stage in the sea, though it may be locked in some fresh water environments like Lake Biwa, and the seaward migration of matured anguillids is a well known phenomenon. Subspecies are similarly numbered as species. S (abbreviation of south) after the specific name shows that the fishes occurs in the tropical or subtropical regions, T means the occurences in the temperate regions throughout Japanese waters, N (abbreviation of north) indicates the occurences in the arctic or subarctic regions, and D shows that the fish is a deep sea species.

Class Cyclostomata 円　口　綱

Order Myxinida メクラウナギ目

Family Eptatretidae ヌタウナギ科

1. *Eptatretus burgeri* (GIRARD) ヌタウナギ　S
2. *Paramyxine atami* DEAN クロメクラウナギ　SD

Order Petromyzonida ヤツメウナギ目

Family Petromyzonidae ヤツメウナギ科

3. *Entosphenus japonicus* (MARTENS) カワヤツメ　N

Class Chondrichthyes 軟　骨　魚　綱

Order Lamnida サメ目

Family Sphyrnidae シュモクザメ科

4. *Sphyrna zygaena* (LINNÉ) シュモクザメ　S

Family Triakidae ドチザメ科

5. *Mustelus manazo* BLEEKER ホシザメ　T
6. *Mustelus griseus* PIETSCHMANN シロザメ　T
7. *Triakis scyllia* MÜLLER et HENLE ドチザメ　S

Family Squalidae ツノザメ科

8. *Squalus acanthias* LINNÉ アブラツノザメ　N
9. *Squalus* (*fernandinus* MOLINA) ツノザメ　S

Family Squatinidae カスザメ科

10. *Squatina japonica* BLEEKER カスザメ　S

Family Alopiidae オナガザメ科

11. *Alopias pelagicus* NAKAMURA オナガザメ　S

Order Rajida エイ目

Family Rajidae ガンギエイ科

12. *Raja pulchra* LIU メガネカスベ　T
13. *Raja fusca* GARMAN クロカスベ　T
14. *Raja porosa* GÜNTHER トバカスベ　S
15. *Raja kenojei* MÜLLER et HENLE ガンギエイ　S
16. *Bathyraja smirnovi* (SORDATOV et PAVLENKO) ドブカスベ　N
17. *Bathyraja isotrachys* (GÜNTHER) ソコガンギエイ　N

Family Dasyatidae アカエイ科

18. *Dasyatis kuhlii* (MÜLLER et HENLE) ヤッコエイ　T
19. *Dasyatis gerrardi* (GRAY) オトメエイ　S
20. *Dasyatis akajei* (MÜLLER et HENLE) アカエイ　S
21. *Urolophus aurantiacus* MÜLLER et HENLE ヒラタエイ　S
22. *Gymnura japonica* (TEMMINCK et SCHLEGEL) ツバクロエイ　S

Family Torpedinidae シビレエイ科

23. *Narke japonica* (TEMMINCK et SCHLEGEL) シビレエイ　T

Family Rhinobatidae サカタザメ科
24. *Rhinobatos hynnicephalus* RICHARDSON コモンサカタザメ S
25. *Rhinobatos schlegeli* MÜLLER et HENLE サカタザメ S

Class Osteichthyes 硬 骨 魚 綱

Order Clupeida ニシン目
Family Megalopidae イセゴイ科
26. *Megalops cyprinoides* (BROUSSONET) イセゴイ S
Family Pterothrissidae ギス科
27. *Pterothrissus gissu* HILGENDORF ギス ND
Family Dorosomatidae コノシロ科
28. *Konosirus punctatus* (TEMMINCK et SCHLEGEL) コノシロ S
Family Dussumieridae ウルメイワシ科
29. *Etrumeus teres* (DE KAY) ウルメイワシ T
Family Clupeidae ニシン科
30. *Sardinops melanosticta* (TEMMINCK et SCHLEGEL) マイワシ T
31. *Harengula zunasi* BLEEKER サッパ S
Family Engraulidae カタクチイワシ科
32. *Engraulis japonica* (HOUTTUYN) カタクチイワシ T
Family Gonorhynchidae ネズミギス科
33. *Gonorhynchus abbreviatus* TEMMINCK et SCHLEGEL ネズミギス S
Family Salmonidae サケ科
34. *Oncorhynchus masou* (BREVOORT) サクラマス N
35. *Oncorhynchus keta* (WALBAUM) サケ N
Family Plecoglossidae アユ科
36. *Plecoglossus altivelis* TEMMINCK et SCHLEGEL アユ T
Family Salangidae シラウオ科
37. *Salangichthys microdon* BLEEKER シラウオ T
Family Argentinidae ニギス科
38. *Glossanodon semifasciatus* (KISHINOUYE) ニギス SD
Family Gonostomatidae ヨコエソ科
39. *Maurolicus japonicus* ISHIKAWA キュウリエソ SD
Family Chirocentridae オキイワシ科
40. *Chirocentrus dorab* (FORSKÅL) オキイワシ S
Order Myctophida ハダカイワシ目
Family Aulopodidae ヒメ科
41. *Hime japonica* (GÜNTHER) ヒメ T
Family Synodontidae エソ科
42. *Synodus macrops* TANAKA チョウチョウエソ S
43. *Synodus hoshinonis* TANAKA ホシノエソ S
44. *Saurida undosquamis* (RICHARDSON) マエソ S

45. *Saurida tumbil* (BLOCH) ワニエソ S
46. *Saurida elongata* (TEMMINCK et SCHLEGEL) トカゲエソ S

Order Ateleopida シャチブリ目

Family Ateleopidae シャチブリ科

47. *Ateleopus japonicus* BLEEKER シャチブリ SD

Order Cyprinida コイ目

Family Cyprinidae コイ科

48. *Tribolodon hakonensis* (GÜNTHER) ウグイ N

Family Plotosidae ゴンズイ科

49. *Plotosus anguillaris* (LACÉPÈDE) ゴンズイ S

Family Tachysuridae ハマギギ科

50. *Tachysurus maculatus* (THUNBERG) ハマギギ S

Order Anguillida ウナギ目

Family Anguillidae ウナギ科

51. *Anguilla japonica* TEMMINCK et SCHLEGEL ウナギ S

Family Congridae アナゴ科

52. *Astroconger myriaster* (BREVOORT) マアナゴ T
53. *Rhynchocymba nystromi nystromi* (JORDAN et SNYDER) ギンアナゴ S

Family Muraenesocidae ハモ科

54. *Muraenesox cinereus* (FORSKÅL) ハモ S

Family Ophichthidae ウミヘビ科

55. *Echelus uropterus* (TEMMINCK et SCHLEGEL) ヒレアナゴ S
56. *Microdonophis erabo* JORDAN et SYNDER モンガラドウシ S
57. *Pisoödonophis boro* (HAMILTON-BUCHANAN) ゴマホタテウミヘビ S
58. *Xyrias revulsus* JORDAN et SNYDER ボウウミヘビ S
59. *Ophisurus macrorhynchus* BLEEKER ダイナンウミヘビ S

Order Belonida ダツ目

Family Belonidae ダツ科

60. *Ablennes anastomella* (CUVIER et VALENCIENNES) ダツ T
61. *Ablennes hians* (CUVIER et VALENCIENNES) ハマダツ S
62. *Tylosurus melanotus* (BLEEKER) テンジクダツ S

Family Scombresocidae サンマ科

63. *Cololabis saira* (BREVOORT) サンマ T

Family Hemiramphidae サヨリ科

64. *Euleptorhamphus longirostris* (CUVIER) トオザヨリ S
65. *Hemiramphus sajori* (TEMMINCK et SCHLEGEL) サヨリ T
66. *Hemiramphus marginatus* (FORSKÅL) ナンヨウザヨリ S

Family Exocoetidae トビウオ科

67. *Cypselurus opisthopterus hiraii* ABE ホソトビ S
68. *Cypselurus heterurus döderleini* (STEINDACHNER) ツクシトビウオ S

Order Gasterosteida トゲウオ目

Family Gasterosteidae トゲウオ科
69. *Gasterosteus aculeatus aculeatus* (LINNÉ) イトウオ N
Order Syngnathida ヨウジウオ目
Family Aulostomidae ヘラヤガラ科
70. *Aulostomus chinensis* (LINNÉ) ヘラヤガラ S
Family Fistulariidae ヤガラ科
71. *Fistularia petimba* LACÉPÈDE アカヤガラ S
Family Macrorhamphosidae サギフエ科
72. *Macrorhamphosus scolopax* (LINNÉ) サギフエ S
Family Syngnathidae ヨウジウオ科
73. *Syngnathus schlegeli* KAUP ヨウジウオ T
74. *Hippocampus coronatus* (TEMMINCK et SCHLEGEL) タツノオトシゴ T
Order Berycida キンメダイ目
Family Holocentridae イットウダイ科
75. *Ostichthys japonicus* (CUVIER et VALENCIENNES) エビスダイ S
76. *Holocentrus spinosissimus* TEMMINCK et SCHLEGEL イットウダイ S
Family Monocentridae マツカサウオ科
77. *Monocentris japonicus* (HOUTTUYN) マツカサウオ S
Order Lamprida アカマンボウ目
Family Trachipteridae フリソデウオ科
78. *Trachipterus ishikawai* JORDAN et SNYDER サケガシラ S
79. *Trachipterus ijimai* JORDAN et SNYDER ユキフリソデウオ S
Family Regalecidae リュウグウノツカイ科
80. *Regalecus russelli* (SHAW) リュウグウノツカイ SD
Order Zeida マトウダイ目
Family Zeidae マトウダイ科
81. *Zeus japonicus* CUVIER et VALENCIENNES マトウダイ S
Order Percida スズキ目
Family Atherinidae トウゴロウイワシ科
82. *Allanetta bleekeri* (GÜNTHER) トウゴロウイワシ S
83. *Hypoatherina tsurugae* (JORDAN et STARKS) ギンイソイワシ S
Family Mugilidae ボラ科
84. *Mugil cephalus* LINNÉ ボラ S
85. *Liza haematocheila* (TEMMINCK et SCHLEGEL) メナダ T
Family Sphyraenidae カマス科
86. *Sphyraena pinguis* GÜNTHER アカカマス S
87. *Sphyraena picuda* BLOCH et SCHNEIDER オニカマス S
Family Polynemidae ツバメコノシロ科
88. *Polydactylus plebejus* (BROUSSONET) ツバメコノシロ S
Family Scombridae サバ科
89. *Thunnus thynnus* (LINNÉ) マグロ S

90. *Thunnus tonggol* (BLEEKER) コシナガ S
91. *Auxis thazard* (LACÉPÈDE) ヒラソウダ S
92. *Auxis tapeinosoma* BLEEKER マルソウダ S
93. *Katsuwonus pelamis* (LINNÉ) カツオ T
94. *Scomber japonicus* HOUTTUYN マサバ T
95. *Scomberomorus niphonius* (CUVIER et VALENCIENNES) サワラ S
96. *Scomberomorus sinensis* (LACÉPÈDE) ウシサワラ S

Family Istiophoridae マカジキ科

97. *Istiophorus platypterus* (SHAW et NODDER) バショウカジキ S
98. *Makaira indica* (CUVIER) シロカジキ S

Family Trichiuridae タチウオ科

99. *Trichiurus lepturus* LINNÉ タチウオ S

Family Coryphaenidae シイラ科

100. *Coryphaena hippurus* LINNÉ シイラ S

Family Lepidotidae シマガツオ科

101. *Lepidotus brama* (BONNATERRE) シマガツオ SD
102. *Steinegeria rubescens* JORDAN et EVERMANN ツルギエチオピア SD

Family Pteraclidae ベンテンウオ科

103. *Centropholis petersi* HILGENDORF リュウグウノヒメ S

Family Carangidae アジ科

104. *Decapterus maruadsi* (TEMMINCK et SCHLEGEL) マルアジ S
105. *Decapterus muroadsi* (TEMMINCK et SCHLEGEL) ムロアジ S
106. *Trachurus japonicus* (TEMMINCK et SCHLEGEL) マアジ T
107. *Caranx delicatissimus* (DÖDERLEIN) シマアジ S
108. *Caranx equula* TEMMINCK et SCHLEGEL カイワリ S
109. *Caranx dinema* BLEEKER S
110. *Caranx helvolus* (FORSTER) オキアジ S
111. *Caranx sexfasciatus* QUOY et GAIMARD ギンガメアジ S
112. *Seriola quinqueradiata* TEMMINCK et SCHLEGEL ブリ T
113. *Seriola purpurascens* TEMMINCK et SCHLEGEL. カンパチ S
114. *Alectis cilialis* (BLOCH) イトヒキアジ S
115. *Naucrates indicus* CUVIER et VALENCIENNES ブリモドキ S

Family Leiognathidae ヒイラギ科

116. *Leiognathus nuchalis* (TEMMINCK et SCHLEGEL) ヒイラギ S
117. *Leiognathus rivulatus* (TEMMINCK et SCHLEGEL) オキヒイラギ S
118. *Leiognathus lineolatus* (CUVIER et VALENCIENNES) イトヒイラギ S

Family Menidae ギンカガミ科

119. *Mene maculata* (BLOCH et SCHNEIDER) ギンカガミ S

Family Stromateidae イボダイ科

121. *Ocycrius japonicus* (DÖDERLEIN) メダイ S
122. *Psenopsis anomala* (TEMMINCK et SCHLEGEL) イボダイ S

Family Nomeidae エボシダイ科
123. *Icticus pellucidus* (LÜTKEN) ハナビラウオ S
124. *Ariomma lurida* JORDAN et SNYDER オオメメダイ S
Family Pampidae マナガツオ科
125. *Pampus argenteus* (EUPHRASEN) マナガツオ S
Family Labracoglossidae タカベ科
126. *Labracoglossa argentiventris* PETERS タカベ S
Family Trichodontidae ハタハタ科
127. *Arctoscopus japonicus* (STEINDACHNER) ハタハタ N
Family Oplegnathidae イシダイ科
128. *Oplegnathus fasciatus* (TEMMINCK et SCHLEGEL) イシダイ T
129. *Oplegnathus punctatus* (TEMMINCK et SCHLEGEL) イシガキダイ S
Family Mullidae ヒメジ科
130. *Upeneus bensasi* (TEMMINCK et SCHLEGEL) ヒメジ S
Family Cepolidae アカタチ科
131. *Cepola schlegeli* BLEEKER スミツキアカタチ S
132. *Acanthocepola krusensterni* (TEMMINCK et SCHLEGEL) アカタチ S
Family Branchiostegidae アマダイ科
133. *Branchiostegus argentatus* (CUVIER et VALENCIENNES) シロアマダイ S
134. *Branchiostegus japonicus japonicus* (HOUTTUYN) アカアマダイ S
135. *Branchiostegus japonicus auratus* (KISHINOUYE) キアマダイ S
Family Apogonidae テンジクダイ科
136. *Apogonichthys carinatus* (CUVIER et VALENCIENNES) マトイシモチ S
137. *Apogon lineatus* TEMMINCK et SCHLEGEL テンジクダイ S
138. *Apogon semilineatus* TEMMINCK et SCHLEGEL ネンブツダイ S
139. *Synagrops japonicus* (STEINDACHNER et DÖDERLEIN) スミクイウオ S
Family Lobotidae マツダイ科
140. *Lobotes surinamensis* (BLOCH) マツダイ S
Family Emmelichthyidae チビキ科
141. *Erythrocles schlegeli* (RICHARDSON) チビキ SD
Family Priacanthidae キントキダイ科
142. *Priacanthus boops* (SCHNEIDER) チカメキントキ S
Family Pomatomidae ムツ科
143. *Scombrops boops* (HOUTTUYN) ムツ S
Family Histiopteridae カワビシャ科
144. *Histiopterus typus* TEMMINCK et SCHLEGEL カワビシャ S
Family Serranidae スズキ科
145. *Döderleinia berycoides* (HILGENDORF) アカムツ S
146. *Diploprion bifasciatus* KUHL et VAN HASSELT キハツソク S
147. *Malakichthys griseus* STEINDACHNER et DÖDERLEIN オオメハタ S
148. *Stereolepis ischinagi* (HILGENDORF) イシナギ T

149. *Epinephelus akaara* (TEMMINCK et SCHLEGEL) キジハタ S
150. *Epinephelus awoara* (TEMMINCK et SCHLEGEL) アオハタ S
151. *Epinephelus moara* (TEMMINCK et SCHLEGEL) クエ S
152. *Epinephelus epistictus* (TEMMINCK et SCHLEGEL) コモンハタ S
153. *Epinephelus septemfasciatus* (THUNBERG) マハタ S
154. *Niphon spinosus* CUVIER et VALENCIENNES アラ S
155. *Chelidoperca hirundinacea* (CUVIER et VALENCIENNES) ヒメコダイ S
156. *Lateolabrax japonicus* (CUVIER) スズキ T
157. *Lateolabrax latus* KATAYAMA ヒラスズキ T
158. *Percanthias japonicus* (FRANZ) シキシマハナダイ S

Family Acropomidae ホタルジャコ科

159. *Acropoma japonicum* GÜNTHER ホタルジャコ S

Family Sciaenidae ニベ科

160. *Argyrosomus argentatus* (HOUTTUYN) イシモチ S

Family Sillaginidae キス科

161. *Sillago sihama* (FORSKÅL) キス S

Family Girellidae メジナ科

162. *Girella punctata* GRAY メジナ S

Family Kyphosidae イスズミ科

163. *Kyphosus lembus* (CUVIER et VALENCIENNES) イスズミ S

Family Sparidae タイ科

164. *Acanthopagrus schlegeli* (BLEEKER) クロダイ S
165. *Pagrus major* (TEMMINCK et SCHLEGEL) マダイ T
166. *Evynnis japonica* TANAKA チダイ S
167. *Sparus sarba* (TEMMINCK et SCHLEGEL) ヘダイ S

Family Lutjanidae フエダイ科

168. *Lutjanus vitta* (QUOY et GAIMARD) ヨコスジフエダイ S

Family Banjosidae チョウセンバカマ科

169. *Banjos banjos* (RICHARDSON) チョウセンバカマ S

Family Nemipteridae イトヨリダイ科

170. *Nemipterus virgatus* (HOUTTUYN) イトヨリダイ S
171. *Nemipterus bathybus* SNYDER ソコイトヨリ S

Family Pentapodidae メイチダイ科

172. *Dentex tumifrons* (TEMMINCK et SCHLEGEL) キダイ S
173. *Gymnocranius griseus* (TEMMINCK et SCHLEGEL) メイチダイ S

Family Pomadasyidae イサキ科

174. *Hapalogenys nigripinnis* (TEMMINCK et SCHLEGEL) ヒゲダイ S
175. *Hapalogenys nitens* RICHARDSON ヒゲソリヒゲダイ S
176. *Hapalogenys mucronatus* (EYDOUX et SOULEYET) セトダイ S
177. *Parapristipoma trilineatum* (THUNBERG) イサキ S
178. *Plectorhynchus cinctus* (TEMMINCK et SCHLEGEL) ヨショウダイ S

Family Theraponidae シマイサキ科
179. *Therapon oxyrhynchus* TEMMINCK et SCHLEGEL シマイサキ S
Family Caesionidae タカサゴ科
180. *Caesio chrysozonus* CUVIER et VALENCIENNES タカサゴ S
Family Aplodactylidae タカノハダイ科
181. *Goniistius zonatus* (CUVIER et VALENCIENNES) タカノハダイ S
182. *Goniistius quadricornis* GÜNTHER ユウダチタカノハ S
Family Parapercidae トラギス科
183. *Neopercis sexfasciata* (TEMMINCK et SCHLEGEL) クラカケギス S
184. *Neopercis multifasciata* (DÖDERLEIN) オキトラギス S
185. *Cilias ommatura* (JORDAN et SNYDER) マトウギス S
Family Champsodontidae ワニギス科
186. *Champsodon snyderi* FRANZ ワニギス SD
Family Uranoscopidae ミシマオコゼ科
187. *Uranoscopus japonicus* HOUTTUYN ミシマオコゼ S
188. *Gnathagnus elongatus* (TEMMINCK et SCHLEGEL) アオミシマ T
Family Callionymidae ネズッポ科
189. *Calliurichthys japonicus* (HOUTTUYN) ヨメゴチ S
190. *Calliurichthys doryssus* (JORDAN et FOWLER) ヤリヌメリ S
191. *Callionymus lunatus* TEMMINCK et SCHLEGEL ネズッポ T
192. *Callionymus richardsoni* BLEEKER ネズミゴチ T
193. *Callionymus flagris* JORDAN et FOWLER ハタタテヌメリ T
194. *Callionymus valenciennesi* TEMMINCK et SCHLEGEL ハタタテダマシ S
195. *Callionymus beniteguri* JORDAN et SNYDER トビヌメリ S
196. *Callionymus planus* OCHIAI ヘラヌメリ S
Family Ammodytidae イカナゴ科
197. *Ammodytes personatus* GIRARD イカナゴ T
Family Tripterygiidae ヘビギンポ科
198. *Tripterygion etheostoma* JORDAN et SNYDER ヘビギンポ S
Family Blenniidae イソギンポ科
199. *Blennius yatabei* JORDAN et SNYDER イソギンポ S
200. *Omobranchus trossulus* (JORDAN et SNYDER) ニジギンポ S
201. *Omobranchus elegans* (STEINDACHNER) ナベカ S
202. *Omobranchus uekii* (KATAYAMA) トサカギンポ S
Family Cryptacanthidae ハダカオオカミウオ科
203. *Cryptacanthoides bergi* LINDBERG ハダカオオカミウオ T
Family Cebidichthyidae カズナギ科
204. *Zoarchias veneficus* JORDAN et SNYDER カズナギ T
Family Pholidae ニジギンポ科
205. *Dictyosoma burgeri* VAN DER HOEVEN ダイナンギンポ T
206. *Enedrias nebulosus* (TEMMINCK et SCHLEGEL) ギンポ T

207. *Pholis ornatus* (GIRARD) アヤギンポ N

Family Stichaeidae タウエガジ科

208. *Ernogrammus hexagrammus* (TEMMINCK et SCHLEGEL) ムスジガジ T

209. *Stichaeus grigorjewi* HERZENSTEIN ナガツカ ND

Family Zoarcidae ゲンゲ科

210. *Enchelyopus elongatus* (KNER) ナガガジ ND

211. *Petroschmidtia toyamensis* KATAYAMA アゴゲンゲ ND

212. *Lycodes teraoi* KATAYAMA ヒナゲンゲ ND

213. *Lycodes nakamurai* (TANAKA) クロゲンゲ ND

214. *Lycodes* sp. ヨコスジクロゲンゲ ND

215. *Lycodes tanakai* JORDAN et THOMPSON タナカゲンゲ ND

216. *Lycodes caudimaculatus* MATSUBARA イレズミゲンゲ N

217. *Davidijordania poecilimon* (JORDAN et FOWLER) サラサガジ N

218. *Gengea japonica* KATAYAMA ニラミゲンゲ ND

219. *Allolepis hollandi* JORDAN et HUBBS ノロゲンゲ ND

Family Brotulidae イタチウオ科

220. *Neobythites sivicolus* (JORDAN et SNYDER) シオイタチウオ SD

221. *Hoplobrotula armata* (TEMMINCK et SCHLEGEL) ヨロイイタチウオ SD

Family Gobiidae ハゼ科

222. *Tridentiger obscurus* (TEMMINCK et SCHLEGEL) チチブ S

223. *Tridentiger trigonocephalus* (GILL) シマハゼ S

224. *Rhinogobius pflaumi* (BLEEKER) スジハゼ S

225. *Cryptocentrus filifer* (CUVIER et VALENCIENNES) イトヒキハゼ S

226. *Acanthogobius flavimanus* (TEMMINCK et SCHLEGEL) マハゼ T

227. *Aboma lacticeps* (HILGENDORF) アシシロハゼ T

228. *Pterogobius zonoleucus* JORDAN et SNYDER チャガラ S

229. *Pterogobius elapoides* (GÜNTHER) キヌバリ S

230. *Pterogobius zacalles* JORDAN et SNYDER リュウグウハゼ S

231. *Pterogobius virgo* (TEMMINCK et SCHLEGEL) ニシキハゼ S

232. *Glossogobius giuris brunneus* (TEMMINCK et SCHLEGEL) ウロハゼ S

233. *Chaenogobius castanea* (O'SHAUGHNESSY) ビリンゴ T

234. *Chaenogobius heptacanthus* (HILGENDORF) ニクハゼ S

235. *Chasmichthys dolichognathus* (HILGENDORF) アゴハゼ S

236. *Chasmichthys gulosus* (GUICHENOT) ドロメ S

237. *Parachaeturichthys polynema* (BLEEKER) ヒゲハゼ S

238. *Chaeturichthys sciistius* JORDAN et SNYDER コモチジャコ T

239. *Leucopsarion petersi* HILGENDORF シロウオ S

240. *Luciogobius guttatus* GILL ミミズハゼ T

241. *Bathygobius fuscus* (RÜPPEL) クモハゼ S

Family Embiotocidae ウミタナゴ科

242. *Ditrema temmincki* BLEEKER マタナゴ・アカタナゴ S

243. *Ditrema viridis* OSHIMA アオタナゴ S

Family Pomacentridae スズメダイ科

244. *Chromis notatus* (TEMMINCK et SCHLEGEL) スズメダイ S

Family Labridae ベラ科

245. *Semicossyphus reticulatus* (CUVIER et VALENCIENNES) コブダイ S

246. *Duymaeria flagellifera* (CUVIER et VALENCIENNES) オハグロベラ S

247. *Pseudolabrus gracilis* (STEINDACHNER) イトベラ S

248. *Pseudolabrus japonicus* (HOUTTUYN) ササノハベラ S

249. *Halichoeres tenuispinnis* (GÜNTHER) ホンベラ S

250. *Halichoeres poecilopterus* (TEMMINCK et SCHLEGEL) キュウセン S

Family Platacidae ツバメウオ科

251. *Platax pinnatus* (LINNÉ) ツバメウオ S

Family Scorpididae カゴカキダイ科

252. *Microcanthus strigatus* (CUVIER et VALENCIENNES) カゴカキダイ S

Family Chaetodontidae チョウチョウウオ科

253. *Chaetodontoplus septentrionalis* (TEMMINCK et SCHLEGEL) キンチャクダイ S

254. *Chaetodon modestus* TEMMINCK et SCHLEGEL ゲンロクダイ S

Family Siganidae アイゴ科

255. *Siganus fuscescens* (HOUTTUYN) アイゴ S

Order Tetraodontida フグ目

Family Triacanthodidae ベニカワムキ科

256. *Triacanthodes anomalus* (TEMMINCK et SCHLEGEL) ベニカワムキ S

Family Balistidae モンガラカワハギ科

257. *Balistes conspicillum* BLOCH et SCHNEIDER モンガラカワハギ S

258. *Canthidermis rotundatus* (PRÓCE) アミモンガラ S

Family Aluteridae カワハギ科

259. *Stephanolepis cirrhifer* (TEMMINCK et SCHLEGEL) カワハギ S

260. *Stephanolepis japonicus* (TILESIUS) ヨソギ S

261. *Rudarius ercodes* JORDANT et FOWLER アミメハギ S

262. *Navodon modestus* (GÜNTHER) ウマズラハギ T

263. *Aluterus monoceros* (LINNÉ) ウスバハギ S

Family Aracanidae イトマキフグ科

264. *Kentrocapros aculeatus* (HOUTTUYN) イトマキフグ S

Family Ostraciontidae ハコフグ科

265. *Ostracion tuberculatus* LINNÉ ハコフグ S

266. *Lactoria cornutus* (LINNÉ) コンゴウフグ S

267. *Lactoria diaphanus* (BLOCH et SCHNEIDER) ウミスズメ S

Family Tetraodontidae フグ科

268. *Lagocephalus lunaris* (BLOCH et SCHNEIDER) サバフグ S

269. *Lagocephalus sceleratus* (GMELIN) センニンフグ S

270. *Fugu niphobles* (JORDAN et SNYDER) クサフグ S

271. *Fugu xanthopterus* (TEMMINCK et SCHLEGEL) シマフグ S
272. *Fugu rubripes* (TEMMINCK et SCHLEGEL) トラフグ S
273. *Fugu stictonotus* (TEMMINCK et SCHLEGEL) ゴマフグ S
274. *Fugu vermicularis vermicularis* (TEMMINCK et SCHLEGEL) ショウサイフグ S
275. *Fugu vermicularis porphyreus* (TEMMINCK et SCHLEGEL) マフグ T
276. *Fugu vermicularis radiatus* (ABE) ナシフグ S
277. *Fugu poecilonotus* (TEMMINCK et SCHLEGEL) コモンフグ S
278. *Fugu pardalis* (TEMMINCK et SCHLEGEL) ヒガンフグ T
279. *Boesemanichthys firmamentum* (TEMMINCK et SCHLEGEL) ホシフグ S
280. *Arothron meleagris* (LACÉPÈDE) ミゾレフグ S
281. *Diodon holacanthus* LINNÉ ハリセンボン S

Family Molidae マンボウ科

282. *Mola mola* (LINNÉ) マンボウ S

Order Cottida カジカ目

Family Scorpaenidae カサゴ科

283. *Sebastes owstoni* (JORDAN et THOMPSON) ハツメ ND
284. *Sebastes inermis* CUVIER et VALENCIENNES メバル T
285. *Sebastes thompsoni* (JORDAN et HUBBS) ウスメバル T
286. *Sebastes joyneri* GÜNTHER トゴットメバル S
287. *Sebastes schlegeli* HILGENDORF クロソイ T
288. *Sebastes vulpes* STEINDACHNER et DÖDERLEIN キツネメバル T
289. *Sebastes oblongus* GÜNTHER タケノコメバル T
290. *Sebastes pachycephalus nudus* MATSUBARA オウゴンムラソイ T
291. *Sebastes pachycephalus pachycephalus* TEMMINCK et SCHLEGEL ムラソイ T
292. *Sebastes pachycephalus chalcogrammus* MATSUBARA アカブチムラソイ S
293. *Sebastes hubbsi* (MATSUBARA) ヨロイメバル S
294. *Sebastiscus marmoratus* (CUVIER et VALENCIENNES) カサゴ T
295. *Sebastiscus albofasciatus* (LACÉPÈDE) アヤメカサゴ S
296. *Helicolenus hilgendorfi* (STEINDACHNER et DÖDERLEIN) ユメカサゴ S
297. *Pontinus macrocephalus* (SAUVAGE) ヒオドシ S
298. *Scorpaena izensis* JORDAN et STARKS イズカサゴ SD
299. *Scorpaena neglecta neglecta* TEMMINCK et SCHLEGEL フサカサゴ S
300. *Pterois lunulata* TEMMINCK et SCHLEGEL ミノカサゴ S
301. *Apistus carinatus* (BLOCH et SCHNEIDER) ハチ S

Family Synanceiidae オニオコゼ科

302. *Minous monodactylus* (BLOCH et SCHNEIDER) ヒメオコゼ S
303. *Inimicus japonicus* (CUVIER et VALENCIENNES) オニオコゼ S

Family Congiopodidae ハオコゼ科

304. *Hypodytes rubripinnis* (TEMMINCK et SCHLEGEL) ハオコゼ S
305. *Erisphex potti* (STEINDACHNER) アブオコゼ S

Family Hexagrammidae アイナメ科

306. *Agrammus agrammus* (TEMMINCK et SCHLEGEL) クジメ S
307. *Pleurogrammus azonus* JORDAN et METZ ホッケ N
308. *Hexagrammos otakii* JORDAN et STARKS アイナメ T

Family Parabembridae ウバゴチ科

309. *Parabembras curtus* (TEMMINCK et SCHLEGEL) ウバゴチ S

Family Platycephalidae コチ科

310. *Onigocia macrolepis* (BLEEKER) アネサゴチ S
311. *Suggrundus meerdervoorti* (BLEEKER) メゴチ S
312. *Inegocia japonica* (TILESIUS) トカゲゴチ S
313. *Inegocia guttata* (CUVIER et VALENCIENNES) ワニゴチ S
314. *Cociella crocodila* (TILESIUS) イネゴチ S
315. *Platycephalus indicus* (LINNÉ) コチ S

Family Hoplichthyidae ハリゴチ科

316. *Hoplichthys langsdorfii* CUVIER et VALENCIENNES ナツハリゴチ S
317. *Hoplichthys regani* JORDAN et RICHARDSON ハリゴチ S

Family Cottidae カジカ科

318. *Marukawichthys ambulator* SAKAMOTO-MATSUBARA マルカワカジカ S
319. *Icelus spiniger cataphractus* (PAVLENKO) ヨロイコオリカジカ ND
320. *Malacocottus gibber* SAKAMOTO-MATSUBARA セッパリカジカ ND
321. *Malacocottus zonurus* BEAN コブシカジカ ND
322. *Furcina ishikawai* JORDAN et STARKS サラサカジカ T
323. *Pseudoblennius percoides* GÜNTHER アナハゼ S
324. *Pseudoblennius cottoides* (RICHARDSON) アサヒアナハゼ T
325. *Pseudoblennius marmoratus* (DÖDERLEIN) アヤアナハゼ S
326. *Bero elegans* (STEINDACHNER) ベロ N
327. *Blepsias cirrhosus draciscus* JORDAN et STARKS イソバテングウ N
328. *Hemitripterus villosus* (PALLAS) ケムシカジカ ND
329. *Alcichthys alcicornis* (HERZENSTEIN) ニジカジカ N
330. *Cottiusculus schmidti* JORDAN et STARKS キンカジカ N
331. *Cottiusculus gonez* SCHMIDT オキヒメカジカ ND
332. *Triglops scepticus* GILBERT ニラミカジカ N
333. *Dasycottus uchidai* MORI アンコウカジカ N

Family Psychroluridae ウラナイカジカ科

334. *Psychrolutes paradoxus* GÜNTHER ウラナイカジカ N

Family Agonidae トクビレ科

335. *Sarritor leptorhynchus knipowitschi* LINDBERG et ANDRIASHEV チカメテング N

Family Triglidae ホウボウ科

336. *Chelidonichthys kumu* (LESSON et GARNOT) ホウボウ S
337. *Pachytrigla alata* (HOUTTUYN) イゴダカホデリ S
338. *Lepidotrigla punctipectoralis* FOLWER ヒレホシカナガシラ T

339. *Lepidotrigla abyssalis* JORDAN et STARKS ソコカナガシラ S
340. *Lepidotrigla kishinouyei* SNYDER オニカナガシラ S
341. *Lepidotrigla microptera* GÜNTHER カナガシラ T

Family Cephalacanthidae セミホウボウ科

342. *Dactyloptena orientalis* (CUVIER et VALENCIENNES) セミホウボウ S
343. *Daicocus peterseni* (NYSTRÖM) ホシセミホウボウ S

Family Cyclopteridae ダンゴウオ科

344. *Cyclolumpus asperrimum* TANAKA コンペイトウ N
345. *Aptocyclus ventricosus* (PALLAS) ホテイウオ N

Family Liparidae クサウオ科

346. *Liparis tanakai* (GILBERT et BURKE) クサウオ ND
347. *Liparis tessellatus* (GILBERT et BURKE) ビクニン ND
348. *Liparis rhodosoma* BURKE トンガリビクニン ND
349. *Careproctus segaliensis* GILBERT et BURKE カラフトビクニン ND
350. *Careproctus pellucidus* GILBERT et BURKE アオビクニン ND
351. *Careproctus sinensis* GILBERT et BURKE セキチクビクニン ND
352. *Careproctus puniceus* MORI シンカイビクニン ND
353. *Crystallias matsushimae* JORDAN et SNYDER アバチャン ND

Order Echeneida コバンザメ目

Family Echeneidae コバンザメ科

354. *Phtheilichthys lineatus* (MENZIUS) スジコバン S
355. *Echeneis naucrates* LINNÉ コバンザメ S

Order Pleuronectida カレイ目

Family Bothidae ヒラメ科

356. *Paralichthys olivaceus* (TEMMINCK et SCHLEGEL) ヒラメ T
357. *Pseudorhombus pentophthalmus* GÜNTHER タマガンゾウビラメ T
358. *Pseudorhombus oligodon* (BLEEKER) ナンヨウガレイ S
359. *Pseudorhombus cinnamoneus* (TEMMINCK et SCHLEGEL) ガンゾウビラメ S
360. *Psettina ijimai* (JORDAN et STARKS) イイジマダルマガレイ SD
361. *Laeops lanceolata* FRANZ ヤリガレイ S
362. *Tarphops oligolepis* (BLEEKER) アラメガレイ S

Family Pleuronectidae カレイ科

363. *Hippoglossoides dubius* (SCHMIDT) アカガレイ N
364. *Acanthopsetta nadeshnyi* SCHMIDT ウロコメガレイ N
365. *Cleisthenes pinetorm herzensteini* (SCHMIDT) ソウハチ N
366. *Eopsetta grigorjewi* (HERZENSTEIN) ムシガレイ T
367. *Verasper variegatus* (TEMMINCK et SCHLEGEL) ホシガレイ S
368. *Verasper moseri* JORDAN et GILBERT マツカワ N
369. *Pleuronichthys cornutus* (TEMMINCK et SCHLEGEL) メイタガレイ T
370. *Lepidopsetta mochigarei* SNYDER アサバガレイ N
371. *Limanda herzensteini* JORDAN et SNYDER マガレイ T

372. *Limanda yokohamae* (GÜNTHER) マコガレイ S
373. *Dexistes rikuzenius* JORDAN et STARKS ミギガレイ T
374. *Platichthys stellatus* (PALLAS) ヌマガレイ N
375. *Kareius bicoloratus* (BASILEWSKY) イシガレイ T
376. *Tanakius kitaharai* (JORDAN et STARKS) ヤナギムシガレイ S
377. *Glyptocephalus stelleri* (SCHMIDT) ヒレグロ N
378. *Microstomus achne* (JORDAN et STARKS) ババガレイ N
379. *Poecilopsetta plinthus* (JORDAN et STARKS) カワラガレイ S
380. *Plagiopsetta glossa* FRANZ ベロガレイ S
381. *Samariscus latus* MATSUBARA et TAKAMUKI ツマリツキノワガレイ S

Family Soleidae ササウシノシタ科

382. *Aseraggodes kobensis* (STEINDACHNER) トビササウシノシタ S
383. *Heteromycteris japonicus* (TEMMINCK et SCHLEGEL) ササウシノシタ S
384. *Zebrias japonicus* (BLEEKER) セトウシノシタ S
385. *Zebrias zebra* (BLOCH et SCHNEIDER) シマウシノシタ S

Family Cynoglossidae ウシノシタ科

386. *Paraplagusia japonica* (TEMMINCK et SCHLEGEL) クロウシノシタ T
387. *Cynoglossus interruptus* (GÜNTHER) ゲンコ S
388. *Cynoglossus* sp. ヒレグロゲンコ S

Order Gadida タラ目

Family Moridae チゴダラ科

389. *Lotella maximowiczi* HERZENSTEIN エゾイソアイナメ ND
390. *Lotella phycis* (TEMMINCK et SCHLEGEL) イソアイナメ S

Family Gadidae タラ科

391. *Gadus macrocephalus* TILESIUS マダラ ND
392. *Theragra chalcogramma* (PALLAS) スケトウダラ ND
393. *Eleginus gracilis* (TILESIUS) コマイ N

Family Bregmacerotidae サイウオ科

394. *Bregmaceros japonicus* TANAKA サイウオ S

Family Coryphaenoididae ソコダラ科

395. *Coelorhynchus multispinulosus* KATAYAMA ヤリヒゲ S

Order Lophiida アンコウ目

Family Lophiidae アンコウ科

396. *Lophius litulon* (JORDAN) キアンコウ T
397. *Lophiomus setigerus* (VAHL) アンコウ T

Family Antennariidae イザリウオ科

398. *Pterophryne histrio* (LINNÉ) ハナオコゼ S
399. *Pterophryne ranina* (TILESIUS) クロハナオコゼ S

Family Oncocephalidae アカグツ科

400. *Halieutaea stellata* (VAHL) アカグツ SD

Considerations

General feature of the fauna

According to our data, there occur in Wakasa Bay the Cyclostomata with 2 orders, 2 families, 3 genera and 3 species, the Chondrichthyes with 2 orders, 9 families, 13 genera and 22 species and the Osteichthyes with 18 orders, 134 families, 274 genera, 370 species and 17 subspecies, amounting to the total number of species and subspecies of 400. Among the Osteichthyes, Percida comprises 173 species and 2 subspecies in 64 families and 127 genera, occupying about 43% of the total number

Table 1. Summary of the fish fauna of Wakasa Bay.

Order	Family	Genus	Species	Subspecies	Affinity			Total
					S	T	N	
Myxinida	1	2	2	0	2	0	0	2
Petromyzonida	1	1	1	0	0	0	1	1
Lamnida	5	6	8	0	5	2	1	8
Rajida	4	7	14	0	8	4	2	14
Clupeida	13	14	15	0	7	5	3	15
Myctophida	2	3	6	0	5	1	0	6
Ateleopida	1	1	1	0	1	0	0	1
Cyprinida	3	3	3	0	2	0	1	3
Anguillida	4	9	9	1	8	1	0	9
Belonida	4	6	9	2	6	3	0	9
Gasterosteida	1	1	1	1	0	0	1	1
Syngnathida	4	5	5	0	3	2	0	5
Berycida	2	3	3	0	3	0	0	3
Lamprida	2	2	3	0	3	0	0	3
Zeida	1	1	1	0	1	0	0	1
Percida	64	127	173	2	136	26	12	174
Tetraodontida	7	16	25	3	24	3	0	27
Cottida	14	45	70	7	33	12	26	71
Echeneida	1	2	2	0	2	0	0	2
Pleuronectida	4	27	33	1	17	7	9	33
Gadida	4	6	7	0	3	0	4	7
Lophiida	3	4	4	0	3	2	0	5
Total	145	290	395	17	272	68	60	400
%					68	17	15	

of species and subspecies, Cottida comprises 70 species and 7 subspecies in 14 families and 45 genera, occupying about 18%, Pleuronectida comprises 33 species and 1 subspecies in 4 families and 27 genera, occupying about 8%, and Tetraodontida comprises 25 species and 3 subspecies in 7 families and 16 genera, occupying about 7%. The Chimaerida, Acipenserida and Gobiesocida and some other orders of rare fishes are not included in the fauna, but the orders of common fishes are all represented here. The family Agonidae is repersented in Wakasa Bay by only a single species. This family comprises many abyssal forms which are living, however, in deep waters

far off the bay. Moreover, as the fishes of this family are of no commercial value, they are seldom brought to the market even though they are caught.

Faunal succession

The Japan Sea has been regarded as the transitional area from the southern to the northern fauna, so that the coastal waters along Honshu Island cannot bedivided into clearly different faunal areas. Some arguments have been advanced in favor of this belief (TANAKA, 1931–'34, NISHIMURA, 1965), although TANAKA set somewhat roughtly the boundary between the southern and northern faunas at about Hamada of the San'in District.

Before the fish fauna of Wakasa Bay is discussed, the sea currents affecting the bay water must be explained as well as the topography of the bay. Wakasa Bay is embraced by Cape Kyoga on the west and by Cape Echizen on the east and furnished with many small embayments such as Miyazu Bay, Maizuru Bay, Obama Bay, Tsuruga Bay and others along the coast which thus assumes a typical Liassic

Table 2. Comparison of the fish distribution along the west coast of Honshu Island.

Regions	San-in District	Wakasa Bay	Toyama Bay	Niigata District
Sources	Mori (1956), Yanai (1950)	Present paper	Katayama (1940, '42)	Honma (1952a-b, '55a-c, '56, '57, '59, '62) Honma et Mizusawa ('66)
Number of species and subspecies	S 309 (61%) T 94 (19%) N 101 (20%)	262 (68%) 68 (17%) 60 (15%)	271 (65%) 62 (15%) 82 (20%)	273 (54%) 97 (20%) 120 (26%)
Total	504	400	415	490

coast line (Fig. 1). The most part of the bay is shallower than 200 m as is shown by isobaths on the map.

The Tsushima Current of warm water washes the coast of Wakasa Bay on its way of northerly flow along the coast of Honshu Island. The water temperature of this current is more than 10°C at about 100 m depth and the salinity is high, 34.2–34.6‰, and the velocity is 0.5–1.0 knot. On the other hand, cold water masses will be formed off northern Korea and Primorskaya District of the U.S.S.R. by winter chilling. The water of low temperature (below 5°C) and low salinity (about 34.1‰) thus produced flows southerly at the speed lower than that of the Tsushima current. The Tsushima Current is about 150 m thick and its influence does not reach the deeper layers. Even in the warm current region along the coast of Honshu Island, the deeper space below the 300 m level is occupied all the year round by the Japan Sea Proper Water with 1°C in water temperature (Fisheries Agency, 1958).

As is shown in Table 2, the number of northern members in the fauna is much smaller in Wakasa Bay than in the San'in District which is situated geographically

south of Wakasa Bay. Probably this is because Wakasa Bay is shallow and the inflow of the deep cold water harbouring northern fishes is checked there. Really, the proportion of northern fishes is so high as to attain 20% in the San'in District as compared with 15% in Wakasa Bay. This shows seemingly that the northern fishes are not distributed in accordance with latitudes in the Japan Sea, though there is a trend of the southern members decreasing in number from south to north. However, so far as the present data are concerned, any distinct boundary cannot be defined between the faunas of the northerly located Hokuriku and southerly located San'in Districts. Lastly, it is very interesting to note that the strandings of southern fishes such as *Trachipterus ishikawai, T. ijimai* and *Mola mola* are met with sometimes on the coast of Wakasa Bay in winter. This phenomenon of not only fishes but also of some other vertebrates and invertebrates is, however, very common on the Japan Sea coast from middle to west Honshu Island (NISHIMURA, 1965).

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